

11TH GEN INTEL® CORE™ WITH IRIS® XE GRAPHICS

DELIVERS THE WORLD'S BEST PROCESSORS FOR THIN AND LIGHT LAPTOPS

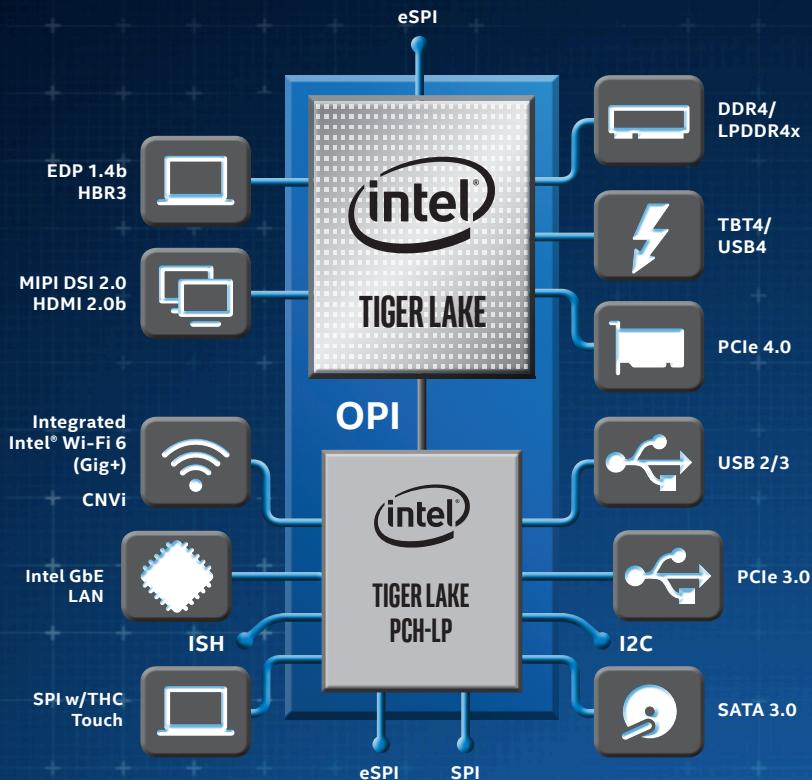
a paradigm shift
in intelligent
performance



World's Best/Highest Performing Processor for ultra thin and light laptops

The 11th Gen Intel Core™ processor is a paradigm shift in intelligent performance and surpasses everything in its class, from a new CPU core and graphics architecture to great AI acceleration and the fast connectivity. It does offer unmatched capabilities in productivity, collaboration, graphics performance and rich media, AI, and battery life – helping people focus, create, and engage at new levels. It is a complete PC platform engineered from the ground up to ensure critical compute functions work together in harmony for the real workflows people do every day – enabling faster, simpler, and richer experiences.

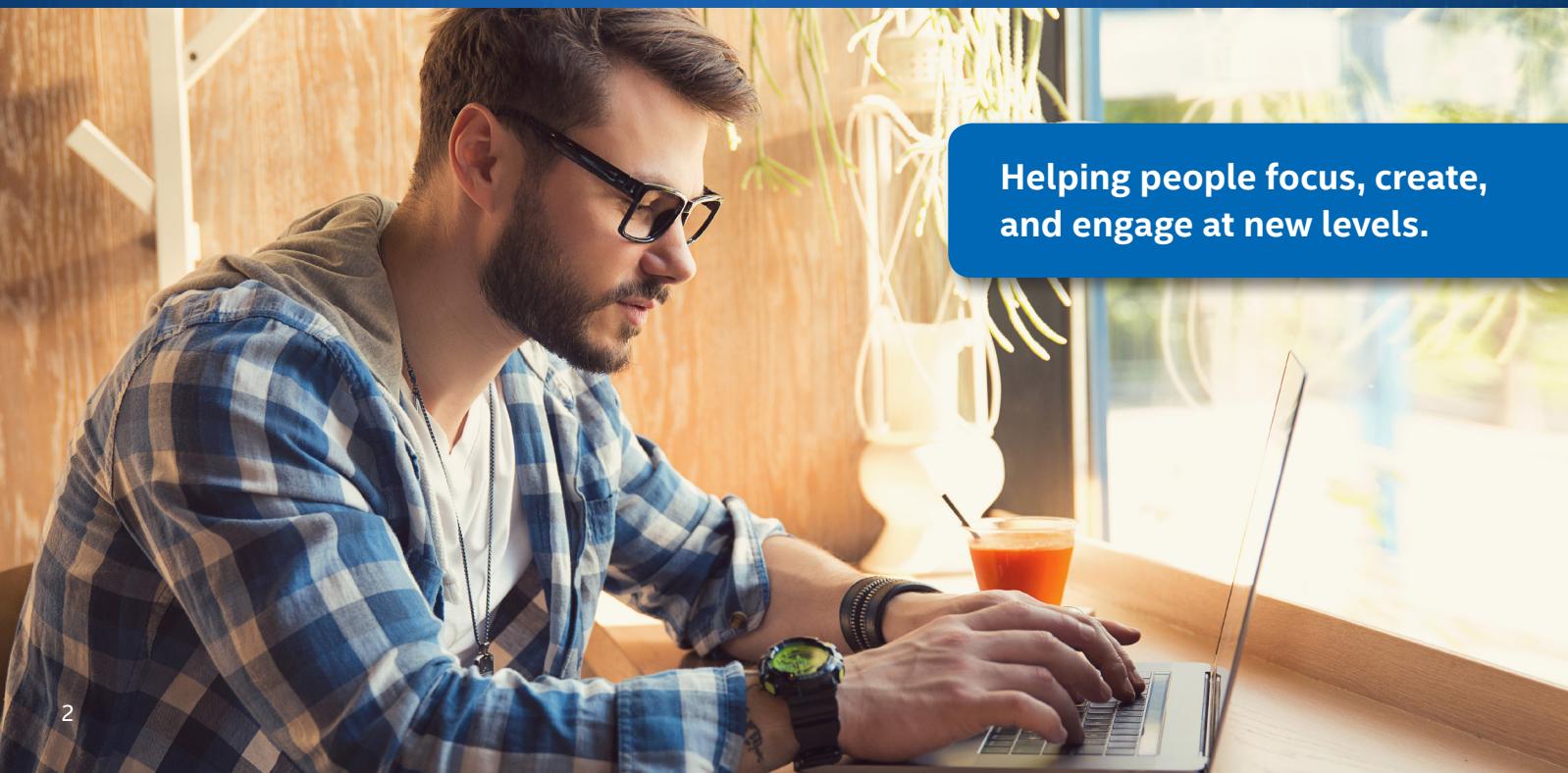
11TH GEN INTEL® CORE™ PROCESSORS KEY/NEW FEATURES*



*Not supported on all SKUs

- **NEW** CPU architecture delivers a leap in overall performance
- **NEW** Intel® Iris® Xe Graphics delivers disruptive 3D, Media, Display, and AI
 - New Media Engine supporting AV1 hardware decode
 - New Display Engine supporting up to 8K HDR
 - New DLBoost (DP4a) support for advanced AI usages
- **NEW** Integrated Thunderbolt™ 4
- **INTEGRATED** Intel® Wi-Fi 6 AX201 (Gig+)
- **NEW** Intel 5G solution (Q1'21) for always/anywhere connectivity
- **NEW** Integrated Image Processing Unit (IPU 6)
- **NEW** CPU-attached PCIe Gen 4 Interface
- **NEW** Gaussian & Neural Accelerator (GNA) 2.0 for Audio/Voice AI
- **NEW** HW-hardened security in silicon
- **IMPROVED** Intel® Adaptix™ Technologies for optimized system performance
- **IMPROVED** battery life
- Intel® Optane™ memory H10 with SSD for amazing system responsiveness

Helping people focus, create, and engage at new levels.



11TH GEN INTEL® CORE™ WITH IRIS® XE GRAPHICS

The 11TH Gen Intel® Core™ mobile processors are the best processors for thin and light laptops, delivering breakthrough intelligent performance, the best productivity, AI-enhanced creation, unmatched HDR entertainment, up to 1080p60 gaming on battery, the ultimate remote collaboration experience, and best-in-class wired and wireless connectivity, eclipsing everything that's in market today.



REVOLUTIONIZING THE WAY REAL PRODUCTIVITY GETS DONE AND OUTPACES ANYTHING ELSE IN THIS CLASS.



- **1ST** Mainstream processor family supporting 7-28W operation
- **1ST** AV1 hardware decode acceleration
- **1ST** Support for 8K 12b HDR, up to 4 simultaneous 4K HDR displays
- **1ST** DLBoost (DP4a) support for advanced AI usages
- **1ST** Native support for INT8 data type (optimized AI performance)
- **1ST** Processor with integrated Thunderbolt™ 4 (superset of USB4)
- **1ST** Image processing solution enabling vision sensing, adaptive dimming
- **1ST** Mainstream client SoC with CPU-attached PCIe Gen 4 Interface
- **1ST** Client SoC with integrated CET, TME HW-hardened security
- **1ST** Client SoC supporting memory scanning off-load to graphics
- **ONLY INTEL** - Integrated Wi-Fi 6 (Gig+) with ~3X throughput of std 802.11ac⁴
- **ONLY INTEL** - Integrated GNA 2.0 for Neural Noise Cancellation CPU-offload
- **ONLY INTEL** - ML-enhanced predictive performance optimization
- **ONLY INTEL** - Intel® Optane™ memory H10 for amazing system responsiveness
- **ONLY INTEL** - Dolby Vision (incl. on ext. monitors), Dolby Atmos, and Dolby IQ

INTELLIGENT PERFORMANCE THAT SCALES

A Performance Leap for 12" Ultra-Thin Fanless to 15" Thin Gaming & Creation. The 11TH Gen Intel® Core™ mobile processors deliver class-leading mobile productivity for consumers, students, and workers. Intel is introducing UP3 and UP4 that each support broader, usable power range leading to expanded platform design advacacies including fanless and fanned designs.

See backup for configuration details. For more complete information about performance and benchmark results, visit www.intel.com/benchmarks.

RELATIVE PERFORMANCE



**PREMIUM, FANNED,
ULTRA-THIN 14 - 15 INCH**

New opportunity for TGL UP4.
Traditional U-series (now UP3) design
point. Similar performance for
UP3 & UP4 @ 15W.



**PREMIUM, ULTRA-THIN
12 - 13 INCH**
[INCLUDING FANLESS]

Amazing fanless productivity!



**THIN GAMING,
THIN CREATOR
14 - 15 INCH**

Unleash full performance of 11th
Gen & Iris® Xe Graphics for creation
& 1080p gaming usages in thin
laptops.



As measured by industry benchmarks, Representative Usage Guide testing and unique features of the Intel® Core™ i7-1185G7 processor, including in comparison to AMD Ryzen 7 4800U, across 5 key usages: productivity, creation, gaming, collaboration, and entertainment. For more complete information about performance and benchmark results, visit www.intel.com/11thgen.

PRODUCTIVITY & CONNECTIVITY

11TH Gen Intel® Core™ mobile processors deliver class-leading mobile productivity for consumers, students, and workers using the most popular applications like Microsoft Office, web browsers, and e-mail. The 11TH Gen Intel® Core™ processors with Intel® Iris™ Xe graphics also brings best-in-class Wi-Fi 6 (Gig+) and support new Thunderbolt™ 4 and a single-cable connection to up to 4 simultaneous 4K displays for even better productivity and fast charging when not on-the-go.

WHAT'S NEW



THUNDERBOLT™ 4

40GB/S INDUSTRY LEADING PERFORMANCE¹

2X THE MINIMUM VIDEO & DATA REQUIREMENTS OF THUNDERBOLT™ 3

- **VIDEO:** Support for two 4K displays or one 8K display
- **DATA:** PCIe at 32 Gb/s for storage speeds up to 3,000 MB/s

EXPANDED END-TO-END SOLUTION CAPABILITIES

- Accessories with four Thunderbolt ports
- Universal 40Gb/s cables up to 2 meters long
- Required PC charging on at least one computer port²
- Required PC wake from sleep when computer is connected to a Thunderbolt dock
- Required Intel VT-d based direct memory access (DMA) protection

USB4 SPECIFICATION COMPLIANT

WHAT'S NEW



WI-FI 6 (GIG+)

4X BETTER PERFORMANCE IN DENSE ENVIRONMENTS³

- Improve average throughput per user by at least 4 times in dense or congested environments

3X FASTER⁴ THAN A 3 YEAR OLD PC ON WI-FI 5

- Faster, more responsive Intel®-based Wi-Fi 6 routers and gateways⁵

COMPATIBLE WITH TODAY'S WI-FI STANDARDS

75% LOWER LATENCY⁶

- More responsive gaming
- Seamless video conferencing

SECURITY FURTHER IMPROVED⁷

- Simplified passwords⁸
- Improved protection vs. wireless hacking

TECHNOLOGY	BENEFIT
Willow Cove	New CPU architecture based on 10nm SuperFin technology in 11 TH gen Intel® Core™ mobile processors that delivers a leap in overall performance
Intel® Iris® Xe Graphics	The all new Intel® Iris® Xe graphics enables discrete-level mainstream graphics performance, support for up to 4 4K HDR external displays. Intel® Iris® Xe graphics enable FHD gameplay at up to 60 fps and revolutionize modern creative workflows with Intel® Deep Learning Boost AI acceleration and the latest AV1 media encode/decode for next-generation work and play experiences previously unimaginable in a sleek, thin and light laptop.
Intel® Deep Learning Boost: VNNI	CPU (AVX) instruction set that efficiently handles INT8 convolutions for Deep Learning inference workloads (required 3 separate instructions in previous generations)
Intel® Deep Learning Boost: DP4A	DP4a is an instruction set running on integrated graphics to accelerate NN (neural network) inferencing with INT8 data type.
Intel® Gaussian & Neural Accelerator (GNA) 2.0	Low power accelerator that offloads noise suppression algorithms off of CPU to reduce power and enable CPU headroom
Image Processing Unit (IPU 6)	A powerful engine integrated in the SOC that delivers pleasing image quality by making hazy images better and preserving details, by delivering great quality even in brightly lit background, by making images excellent in dark environment, and recovering color information from IR contamination
AV1	AV1 CODEC is a video format standard for improved video call stability and higher quality, even at low-bandwidth. It provides great video conferencing experience at low bandwidths.
PCIe Gen 4 Interface	PCIe 4.0 is the fourth generation of the Peripheral Component Interconnect Express (PCIe) motherboard interface. It doubles the maximum throughput from PCIe Gen 3.0 going from a maximum data transfer rate of ~16 GB/s to ~32 GB/s
Thunderbolt™ 4	Thunderbolt™ 4 is the most advanced single-cable connection available with up to 40 Gb/s for data and video transfer (it doubles the minimum video and data requirements of Thunderbolt™ 3). Its single-cable docks are up to 2 meters long with charging, external graphics, and built-in networking capabilities and support up to 4 simultaneous 4K displays.
Wi-Fi 6 (Gig+)	Intel® Wi-Fi 6 (Gig+) delivers nearly 3X ⁴ faster downloads, and more reliable connections. Delivers best-in class ⁹ wireless experiences with the freedom and flexibility to be productive anywhere throughout the home or office.
Intel® Adaptix™ Technologies	Intel® Adaptix™ technology is a collection of 4 advanced software packages designed to optimize performance and hence enhance the experience of Intel® processors-based PCs and form factors. Using these free tools, consumers win by experiencing better performance and enjoyment with their PC by customizing it to their needs while OEMs can access some of the best PC performance tuning tools in the industry.
Intel® Control-Flow Enforcement Technology (Intel® CET)	Intel® CET provides protection in hardware to defend against control flow subversion techniques. Intel CET is designed to protect against the misuse of legitimate code through control-flow hijacking attacks – widely used techniques in large classes of malware.
Intel® Total Memory Encryption	Intel® Total Memory Encryption (Intel® TME) helps protect against data exposure via physical attack on memory. Total Memory Encryption (TME) – provides the capability to encrypt the entirety of the physical memory of a system.

FEATURE TABLE: 11TH GEN UP3 & UP4 PROCESSORS

	INTEL® CORE™ PROCESSOR FAMILY - UP3					INTEL® CORE™ PROCESSOR FAMILY - UP4			
Cores/Threads	i7-1185G7	i7-1165G7	i5-1135G7	i3-1125G4	i3-1115G4	i7-1160G7	i5-1130G7	i3-1120G4	i3-1110G4
Graphics (EUs)	96	96	80	48	48	96	80	48	48
Cache (MB)	12	12	8	8	6	12	8	8	6
Operating Range (W)	12-28	12-28	12-28	12-28	12-28	7-15	7-15	7-15	7-15
Base Block Speed (GHz)	3.0	2.8	2.4	2.0	3.0	1.2	1.1	1.1	1.8
Maximum Single Core Turbo Freq. (GHz)	4.8	4.7	4.2	3.7	4.1	4.4	4.0	3.5	3.9
Maximum All Core Turbo Freq. (GHz)	4.3	4.1	3.8	3.3	4.1	3.6	3.4	3.0	3.9
Graphics Max Freq. (GHz)	1.35	1.3	1.3	1.25	1.25	1.1	1.1	1.1	1.1
Memory Support	DDR4-3200 LPDDR4x-4266	DDR4-3200 LPDDR4x-4266	DDR4-3200 LPDDR4x-4266	DDR4-3200 LPDDR4x-4266	DDR4-3200 LPDDR4x-4266	LPDDR4x-4266	LPDDR4x-4266	LPDDR4x-4266	LPDDR4x-4266

Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors.

Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more complete information visit www.intel.com/benchmarks.

Performance results are based on testing as of dates shown in configurations and may not reflect all publicly available updates. See www.intel.com/11thgen for configuration details. No product or component can be absolutely secure.

Results that are based on pre-production systems and components as well as results that have been estimated or simulated using an Intel Reference Platform (an internal example new system), internal Intel analysis or architecture simulation or modeling are provided to you for informational purposes only. Results may vary based on future changes to any systems, components, specifications or configurations.

Intel's compilers may or may not optimize to the same degree for non-Intel microprocessors for optimizations that are not unique to Intel microprocessors. These optimizations include SSE2, SSE3, and SSSE3 instruction sets and other optimizations. Intel does not guarantee the availability, functionality, or effectiveness of any optimization on microprocessors not manufactured by Intel. Microprocessor-dependent optimizations in this product are intended for use with Intel microprocessors. Certain optimizations not specific to Intel microarchitecture are reserved for Intel microprocessors. Please refer to the applicable product User and Reference Guides for more information regarding the specific instruction sets covered by this notice.

1 For thin-and-light laptops that require less than 100 watts to charge.

2 As compared to other PC I/O connection technologies including eSATA, USB, and IEEE 1394 Firewire. Performance will vary depending on the specific hardware and software used. Must use a Thunderbolt-enabled device.

3 4X Capacity/Scalability: This claim is based on a comparison of overall network capacity for similarly sized 802.11 ax vs. 802.11 ac networks. The IEEE 802.11-14/0165r1 802.11 AX specification amendment defines standardized modifications to both the IEEE 802.11 physical layers (PHY) and the IEEE 802.11 Medium Access Control layer (MAC) that enable at least one mode of operation capable of supporting at least four times improvement in the average throughput per station (measured at the MAC data service access point) in a dense deployment scenario, while maintaining or improving the power efficiency per station. For additional details visit: <https://mentor.ieee.org/802.11/dcn/14/11-14-0165-01-0hew-802-11-hew-sg-proposed-par.docx>

4 Nearly 3X Faster: 802.11ax 2x2 160MHz enables 2402Mbps maximum theoretical data rates, ~3X (2.8X) faster than standard 802.11ac 2x2 80MHz (867Mbps) as documented in IEEE 802.11 wireless standard specifications, and require the use of similarly configured 802.11ax wireless network routers.

5 Requires a router based on 802.11ax supporting OFDMA and multiple clients on the network with support for AX. Better in dense environments is achievable from OFDMA feature supported by 802.11ax clients and APs. 2Gbps based on assumptions of approximately 70% of IEEE 802.11 specification theoretical maximum data rates for 802.11ax 160 MHz 2402Mbps.

6 75% Latency reduction: is based on Intel simulation data (79%) of 802.11ax with and without OFDMA using 9 clients. Average latency without OFDM is 36ms, with OFDMA average latency is reduced to 7.6ms. Latency improvement requires that the 802.11ax (Wi-Fi 6) router and all clients support OFDMA.

7 WPA3 Wi-Fi Security Features: The Wi-Fi Alliance industry consortium will certify Wi-Fi 6 products for compliance with the IEEE 802.11 ax standard, and will require WPA3 security certification as a pre-requisite to ensure the latest in Wi-Fi security features. WPA3 Simplified Passwords: WPA3 uses Simultaneous Authentication of Equals (SAE) to replace the Pre-Shared Key (PSK) exchange protocol used by WPA2. SAE more securely handles initial key exchange and uses forward secrecy, which makes it more resistant to offline decryption attacks and provides stronger password-based authentication. WPA3 Enhanced Protection: Additional network protection comes from the equivalent of 192-bit cryptographic strength (across an 802.11ax network and is superior to the 128-bit AES encryption utilized with WPA2).

8 Personal password security is based on IEEE requirement for 802.11ax to support WPA3 which is the latest in security and leverages SAE providing more resilient password-based authentication

9 Best in Class Wi-Fi 6: Intel® Wi-Fi 6 (Gig+) products support optional 160 MHz channels, enabling the fastest possible theoretical maximum speeds (2402 Mbps) for typical 2x2 802.11ax PC Wi-Fi products. Premium Intel® Wi-Fi 6 (Gig+) products enable 2-4X faster maximum theoretical speeds compared standard 2x2 (1201 Mbps) or 1x1 (600 Mbps) 802.11ax PC Wi-Fi products, which only support the mandatory requirement of 80 MHz channels.

All product plans and roadmaps are subject to change without notice.

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